

### Evaluating regional competitiveness policies: insights from the new economic geography

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## EVALUATING REGIONAL COMPETITIVENESS POLICIES: INSIGHTS FROM THE NEW ECONOMIC GEOGRAPHY

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**EVALUATING REGIONAL COMPETITIVENESS POLICIES:  
INSIGHTS FROM THE NEW ECONOMIC GEOGRAPHY**

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**Abstract:** This paper examines the relevance of theoretical insights emerging from the new economic geography (NEG) for the evaluation of regional competitiveness policies. The major value of the NEG for evaluation is that it offers a clear theory of change on how policy can be expected to impact on regional competitiveness and a theoretical framework for considering potential impacts on national growth as well as spatial equity. Its insights can inform the questions that evaluators pose and the processes they seek to measure. NEG ideas on the influences on competitiveness and their outcomes suggest several new evaluation challenges, including extending the scope of the activities evaluated, assessing inter-relationships among regions, assessing impacts on net agglomeration economies, evaluating the trade-off between

growth and equity and understanding threshold effects.

Regional competitiveness      Regional policy      Evaluation      New Economic  
Geography

*JEL classifications:* R00 R11 R12 R58

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CRES-2006-0043.R2 **EVALUATION DES POLITIQUES DE**  
**COMPETITIVITE REGIONALE : POINT SUR LA NOUVELLE**  
**GEOGRAPHIE ECONOMIQUE**

JONATHAN POTTER

**Résumé :** Cet article examine la pertinence des informations théoriques émergeant de la nouvelle géographie économique (NEG) pour évaluer les politiques de compétitivité régionale. L'intérêt principal de la NEG pour cette évaluation réside dans le fait qu'elle offre une théorie précise du changement et sur l'impact que l'on peut attendre de la politique sur la compétitivité régionale ; la NEG offre un cadre théorique permettant de considérer les impacts potentiels sur la croissance nationale et sur l'équité spatiale. Ces informations peuvent répondre aux questions que les évaluateurs se posent et sur les processus qu'ils essayent de mesurer. Les idées de la NEG concernant les influences sur la compétitivité et leurs résultats suggèrent plusieurs nouvelles menaces pour l'évaluation, y compris l'extension du domaine des activités évaluées, l'évaluation des relations entre régions, l'évaluation des impacts sur les économies d'agglomération nettes, l'évaluation des arbitrages entre la croissance et l'équité et la connaissance des effets de seuil.

Compétitivité régionale, politique régionale, évaluation, nouvelle géographie économique

*Classement JEL :* R00 R11 R12 R58

CRES-2006-0043.R2  
**Bewertung regionaler Wettbewerbspolitiken: Einblicke der neuen  
Wirtschaftsgeografie**

JONATHAN POTTER

Abstract:

In diesem Beitrag wird untersucht, wie relevant die theoretischen Einblicke der neuen Wirtschaftsgeografie für die Bewertung der regionalen Wettbewerbspolitiken sind. Der wichtigste Wert der neuen Wirtschaftsgeografie liegt darin, dass sie eine klare Theorie der Veränderung im Zusammenhang mit der Frage bietet, inwieweit von der Politik Auswirkungen auf die regionale Wettbewerbsfähigkeit zu erwarten sind, und dass sie einen theoretischen Rahmen zur Untersuchung der potenziellen Auswirkungen auf das landesweite Wachstum sowie auf das räumliche Gleichgewicht liefert. Diese Einblicke können sich auf die von Bewertern gestellten Fragen sowie auf die von ihnen zu messenden Verfahren auswirken. Die Ideen der neuen Wirtschaftsgeografie über die Einflüsse der Wettbewerbsfähigkeit und ihre Ergebnisse in diesem Zusammenhang legen mehrere neue Bewertungsmethoden nahe, darunter eine Erweiterung des Umfangs der bewerteten Aktivitäten, eine Bewertung der Wechselwirkungen zwischen Regionen, eine Untersuchung der Auswirkungen auf Netto-Agglomerationswirtschaften, eine Bewertung des Ausgleichs zwischen Wachstum und Gleichgewicht sowie ein Verständnis der Schwelleneffekte.

Regionale Wettbewerbsfähigkeit

Regionalpolitik

Bewertung

Neue Wirtschaftsgeografie

JEL classifications: R00 R11 R12 R58

CRES-2006-0043.R2

Evaluación de las políticas de competitividad regional: ideas de la nueva geografía económica

JONATHAN POTTER

**Abstract:**

En este artículo examino la importancia de las ideas teóricas que surgen de la nueva geografía económica para la evaluación de las políticas competitivas regionales. El principal valor de la nueva geografía económica para la evaluación consiste en que ofrece una clara teoría de cambio en cuanto a cómo puede repercutir la política en la competitividad regional y una estructura teórica para considerar los posibles efectos en el crecimiento nacional y en la igualdad espacial. Esta perspectiva puede responder a las preguntas que plantean los evaluadores y los procesos que quieren medir. Las ideas de la nueva geografía económica sobre las influencias que se ejercen en la competitividad y sus resultados indican varios retos nuevos de evaluación, entre ellos una ampliación del alcance de las actividades evaluadas, la valoración de las interrelaciones entre las regiones, la valoración del efecto en las economías netas de aglomeración, la valoración de la compensación entre el crecimiento y la igualdad y la comprensión de los efectos umbrales.

Competitividad regional

Política regional

Evaluación

Nueva geografía económica

JEL classifications: R00 R11 R12 R58

## 1. Introduction

The issues of regional competitiveness and regional policy evaluation have generated much recent academic and policy debate, reflected for example in recent special issues of Regional Studies (volumes 38.9, 2004, and 40.2, 2006). This paper seeks to contribute to this debate by exploring how emerging work in spatial economics, often referred to as the new economic geography (NEG), can add to our understanding of how policy impacts on regional competitiveness and therefore assist in the development of clearer theories of change for regional policy evaluation. The paper argues that whilst the NEG has its limits, and would be difficult to operationalise as an empirical evaluation tool, its insights potentially offer important theoretical guidance to those commissioning and undertaking regional policy evaluations.

The increasing influence of the competitiveness concept in regional policy making is witnessed by a series of recent competitiveness policy documents from organisations such as the EUROPEAN COMMISSION (1994, 1999, 2001, 2004), the WORLD BANK (2000, 2005) and a wide range of national and regional governments. However, there is still some unease about the nebulous nature of the theoretical foundations of regional competitiveness policies, and this is a



key concern for evaluation because good evaluation depends on having a clear theory of change of how policy is expected to achieve its objectives. The underlying problem is put by KITSON, MARTIN and TYLER (2004, p. 992):

*‘What, precisely, is meant by the competitiveness of regions, cities and localities? In what sense do regions and cities compete? How can regional competitiveness be measured? What are the connections between regional competitiveness and regional economic prosperity? Although the academic literature on regional and urban competitiveness has been expanding . . . , there is still no generally agreed theoretical or empirical framework for answering these questions.’*

If we take the NEG as our intellectual foundation then we can start to address these issues. From the NEG perspective, regional competitiveness can be seen as the relative capacity of regions to attract mobile factors from each other and host economic activity. This may be influenced by a broad set of ‘regional competitiveness policies’, taken as policies that have as a principal objective the aim of influencing regional competitiveness seen in terms of the capacity to attract and retain mobile factors and associated economic activity. They encompass measures to increase the productive capabilities of agents in target regions, improve the regional competitive environments in which agents operate and redistribute economic activity among regions through more direct incentives and controls.

The NEG provides a framework for understanding the potential effects of these policies. However, one of the obstacles to its use by policy makers is its mathematical exposition and complexity, despite some recent non-mathematical policy papers (OTTAVIANO, 2003; COMBES, DURANTON and OVERMAN, 2005). In order to encourage greater dialogue between the academic and policy communities in this area, this article therefore sets out to

explore some of the policy insights of the NEG and discuss how they may be applied to the evaluation of regional competitiveness policies. Section 2 reviews the strengths and limitations of the NEG for regional competitiveness policy evaluation. Section 3 identifies some important theoretical insights from the NEG on how regional policy can be expected to influence competitiveness and hence on what evaluation needs to assess. Section 4 examines the challenges these new insights raise for regional policy evaluation. The final section concludes.

## 2. Strengths and limitations of the NEG for policy evaluation

One of the major potential values of integrating NEG insights into the evaluation of regional competitiveness policies is that the NEG lays claim to providing a clear and unified theoretical foundation for understanding how policy influences spatial development. Its predicted processes and impacts can clearly be traced back to decentralised decisions by agents maximising their objective functions (profit-maximising firms and utility-maximising households) in response to price signals, and the consequences of these decisions are brought together in a general equilibrium framework that identifies the aggregate economic impacts across inter-linked markets. Using this logical framework highlights the possibility that policy may sometimes have impacts that are different to those that might be assumed at first sight, underlining the need for evaluation to explore potential unexpected impacts and processes.

Making the theory of change behind policy intervention explicit in this way would seem to be an improvement over evaluation approaches in which programme logics and the theories on which they are based are absent or unspecified, but can also be argued to represent a significant improvement over the eclectic approaches that are currently common in competitiveness thinking. The latter are typified by the use of the 'pyramid diagram', which identifies drivers of

competitiveness from the viewpoints of various overlapping theories and has been used in a number of recent academic and policy papers (BEGG, 1999; CAMBRIDGE ECONOMETRICS *et al.*, 2003; MARTIN, 2005; GARDINER, MARTIN and TYLER, 2004; SIMMIE *et al.*, 2006). In the case of SIMMIE *et al.* (2006, Fig. 2.7, p. 39) the drivers of competitiveness are drawn from each of export base, increasing returns, knowledge and innovation, cluster, cultural economy and evolutionary theories. Whilst this has the advantage of identifying a wide range of potentially important influences, it provides little guidance on their relative importance or on how to deal with potential incompatibilities among them. This leaves evaluators with the difficulty of knowing quite what to measure and what weight to place on examination of the different processes thought to be in play. From a positivist perspective, the eclectic approach can also be seen as lacking basic scientific rigour in the sense of generating falsifiable hypotheses. In this context, a major potential strength of the NEG is that it may offer a clearer logic model for evaluation than the ‘absent theory’ and ‘eclectic theory’ approaches.

A second major potential value is that dynamic NEG models provide evaluators with a theoretical basis for identifying how regional policy may promote sustained national growth. This is important because mainstream theoretical guidance to date, as inspired by the neoclassical and Keynesian schools, has concentrated on the redistribution role of regional policy, or at most the one-off national efficiency gains that might be achieved by bringing unemployed resources into use in lagging regions, rather than the role of regional policy in fostering sustained national growth. Dynamic NEG models provide for the first time a mainstream, spatially-specific theoretical framework for understanding how regional policy may foster growth by stimulating agglomeration benefits driving increasing returns to the use of capital, labour and knowledge. If evaluation confirmed hypothesised positive impacts on growth it would suggest that regional policy costs might be matched or exceeded by increased tax revenues stemming from greater

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3 national economic growth, even in a context of full employment of resources, with obvious  
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5 relevance to the justification for regional policy.  
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10 However, the NEG also has some significant limitations as a guide for policy evaluation. These  
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12 mainly concern a large degree of abstraction from local context, difficulties in operationalising  
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14 NEG models as empirical tools, and problems with the details of certain assumptions, implied  
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16 processes and predictions of the models. On the first issue, MARTIN (1999a) has argued that the  
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18 NEG's mathematical modelling and its grounding in mainstream economics excludes many  
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20 social, cultural, political and institutional factors that are important in regional development and  
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22 that would be better picked up through local case study analysis and stakeholder dialogue. Whilst  
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24 this argument has merit, it should nonetheless be recognised that any theory of change must  
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26 abstract from reality if it is to provide generalisable insights. Furthermore, incorporating NEG  
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28 hypotheses in evaluation programmes does not preclude the use of multiple research methods to  
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30 test the validity of these hypotheses, including case study analysis and stakeholder dialogue as  
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32 well as quantitative econometric and modelling approaches.  
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38 On the second issue, whilst the NEG is putting increased emphasis on policy applications, it is  
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40 fairly coarse in the nature of the policies that can be modelled. BALDWIN *et al.* (2003) for  
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42 example use NEG models to explore the potential impact of trade policies, tax policies,  
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44 infrastructure policies and regional subsidies, but there is little capacity to disaggregate within  
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46 these policy areas. Furthermore, certain policy types, such as training policies, have not yet been  
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48 much explored. Another problem is that NEG models rarely allow for assessment of policy  
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50 impacts in a context where one or more regions have unemployed resources, although this is often  
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52 the case in lagging regions, whilst the modelling of situations where there is imperfect labour  
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54 mobility is also underdeveloped. Thus the models are not as policy relevant as they might be.  
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Furthermore, if we were to seek to operationalise NEG models for policy evaluation it would be necessary to undertake empirical work on the ground to establish how far given policy inputs change given parameters in the models used and to calibrate the models to specific regional circumstances. Thus although NEG models can in principle be used to provide ex ante estimates of potential policy impacts, as in the case of the REMI model (FAN, TREYZ and TREYZ, 2000; TREYZ and TREYZ, undated), this paper argues that the main current function of the NEG in regional policy evaluation should be to provide hypotheses on how policy is likely to work and the impacts it is likely to have, which can then be followed up using standard evaluation research programmes.

NEARY (2001) provides an excellent discussion of the third issue, concerning the details of the assumptions, implied processes and predictions of NEG models. We may highlight in particular the reliance of many models on special functional forms and numerical simulations to achieve results, simplified accounts of firm strategies, simplified treatment of transport costs, the one-dimensional treatment of space, and strong sensitivity of predicted results to assumptions made about parameter values representing the context in which policy is applied. Although the progressive development of NEG work is gradually taking into account many of these concerns, the limitations of existing model specifications tend to confirm the view that the NEG is best used as a guide to identify important evaluation questions rather than as an operational evaluation tool in itself.

Finally, it should be recognised that although the NEG raises important issues about regional policy processes, including the role of agglomeration economies, circular causation effects and endogenous growth processes, it is not the only theoretical framework that identifies these issues. Kaldorian theory, evolutionary growth models, Porterian cluster theory and traditional economic

geography, for example, all pick up on elements of this analysis within their own frameworks. At the same time, however, the NEG has the advantage of offering a unifying framework for assessing what would otherwise be a series of disparate observations, whilst it should also be noted that there is ongoing work that seeks to extend the perspectives offered by current NEG theory by developing more realistic models and drawing on other theories such as the large urban economics literature (FINGLETON, 2007; COMBES, DURANTON and OVERMAN, 2005).

Given these strengths and limitations, a balanced view needs to be taken on the role the NEG might play in regional policy evaluation. The view taken here is that the NEG is certainly not a ready-made evaluation tool, but it does raise some important issues about the way regional policy can be expected to work which should be understood by evaluators and incorporated into regional policy evaluation frameworks. NEG ideas on how regional policy is likely to impact on regional competitiveness and the main implications of this for evaluation are discussed in the next two sections.

### **3. Regional policy and competitiveness from the NEG perspective**

Whilst there is continuing debate about the precise meaning of regional competitiveness (BRISTOW, 2005; CAMAGNI, 2002; PORTER, 1998, 2001, 2003; REGIONAL STUDIES, special issue 38.9, 2004; URBAN STUDIES, special issue 36.5/6, 1999), there is increasing support for the view that the critical issue concerns the capacity of regions to attract labour and capital from others, which is driven by their productivity and the returns they can offer to capital and labour and reflected by their 'revealed competitiveness' in terms of their share of economic activity (KRUGMAN, 2005). This interpretation fits well with the NEG, which explores the

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major influences on inter-regional capital and labour flows and regional economic activity shares. Moreover, in contrast to standard neoclassical models that suggest that capital and labour flows will contribute to restoring balance in the competitiveness of growing and declining regions, the NEG suggests that factor flows could result in positive and negative externalities that drive circular causation processes and could instead result in strong and persistent regional disparities. This would appear to better explain observed spatial patterns of production and their shifts over time than the standard neoclassical position.

The NEG is a term that covers a broad family of models, each emphasising somewhat different processes (BALDWIN *et al.*, 2003; BRAKMAN, GARRETSEN and VAN MARREWIJK, 2001; FUJITA, KRUGMAN and VENABLES, 1999; OTTAVIANO and PUGA, 1998). The key commonality is that they all seek to relate the spatial distribution of production to a trade-off between agglomeration and dispersion forces in the presence of varying degrees of trade costs (transport costs and other geographical interaction costs such as the costs of search and communication). Table 1 shows a range of models and the main agglomeration and dispersion forces they assume. The forces modelled are simplified, as is characteristic of economic models, but may capture the essence of more complex processes whilst at the same time lending themselves to extensions that may examine certain processes in more detail. Changes in these agglomeration and dispersion forces are seen to affect the spatial distribution of production via changes in the returns that regions offer to mobile factors. A common feature that holds across the models is that as trade costs reduce, the agglomeration forces tend to strengthen more rapidly than the dispersion forces such that, all else being equal, trade cost reductions will lead to spatial concentration. The welfare implications are nonetheless complicated by the fact that if labour and capital are fully mobile and respond fully to their objective functions then we would expect equalisation of factor returns across regions whatever the spatial distribution of production. In

other words spatial concentration does not necessarily imply any differences in regional incomes per head. However, spatial shifts would be expected to lead to disparities per head if there are barriers to factor (particularly labour) mobility or if prices (particularly wages) are sticky, which is the typical situation in real world contexts.

#### INSERT TABLE 1

An important distinction should be made between static and dynamic NEG analysis. Static models, including the original core-periphery model developed by KRUGMAN (1991), assume a fixed volume of production or no long run national growth and are useful for exploring influences on spatial disparities. However, the crucial issue of influences on national growth must be explored through dynamic models in which the long run growth rate is endogenous. In these models a key influence on growth is the existence of increasing returns to agglomeration size. There is significant recent academic work on the nature of these agglomeration economies and various ways of categorising them (ABDEL-RAHMAN, 2000; ROSENTHAL and STRANGE, 2004; DURANTON AND PUGA, 2004; FUJITA and THISSE, 2000). However, Marshall's (1920) early observation of a triad of externalities within geographical industry concentrations – thicker labour markets, greater industry specialisation and technology spillovers – remains a useful basic framework, together with recognition of the capacity of firms to exploit internal economies of scale under monopolistic competition.

One of the most commonly used dynamic NEG models for the purpose of policy analysis is the Local Spillovers (LS) model (BALDWIN and FORSLID, 2000; BALDWIN and MARTIN, 2004; FUJITA and THISSE, 2002, 2003; KRUGMAN and VENABLES, 1995; MARTIN, 1998, 1999b; MARTIN and OTTAVIANO, 1999, 2001). Growth in this model occurs because



knowledge spillovers are seen to drive a learning curve effect through which the marginal cost of producing an innovation falls as the stock of knowledge capital grows. It therefore concentrates on only one of Marshall's three agglomeration forces, and moreover excludes the role of labour mobility, working instead through capital mobility alone, but has the major advantage of permitting analysis of the potential effects of a linkage between agglomeration and growth in a simplified framework.

***The NEG/LS model with congestion***

To keep the length of discussion here manageable whilst at the same time pulling out many of the major NEG insights, we now focus on one specific model, the LS model and its extension to include the effects of congestion in agglomerations above a certain size. Whilst the illustration is from one selected model with its own specificities, it is reassuring to note that the major policy processes and policy implications of the NEG have been shown to hold across a range of models (BALDWIN *et al.*, 2003).

The LS model can be seen as a good choice for informing regional policy evaluation because it is a dynamic model enabling exploration of potential influences on national growth as well as regional disparities. Moreover, its focus on localised knowledge spillovers as a major agglomeration and growth force corresponds to a recent wave of academic work on the key role of knowledge and innovation in explaining spatial development processes and to the central role given to promoting innovation in many regional competitiveness strategies (AUDRETSCH and FELDMAN, 2004; DURANTON, 2006; DURANTON and PUGA, 2001; EUROPEAN PLANNING STUDIES, Special Issue, 14.9, 2006; GLAESER *et al.*, 1992; KEEBLE and WILKINSON, 2000; OTTAVIANO and THISSE, 2004). The extension to include congestion effects (increased costs of premises, transport, labour etc) as agglomerations grow adds further

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3 relevance, as it reflects what may be a common situation in countries dominated by a growing  
4 and potentially congested metropolitan core (Britain and London; Ireland and Dublin; Latvia and  
5 Riga etc), where an important policy debate concerns whether economic efficiency is favoured by  
6 concentration or dispersal of economic activity.  
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14 The details of the LS model are set out in BALDWIN *et al.* (2003, chapter 7) and MARTIN and  
15 OTTAVIANO (1999, 2001) and its extension to include congestion is given in BALDWIN *et al.*  
16 (2003, section 17.3). The basic model concerns a two-region economy with two consumption  
17 sectors: agriculture and manufacturing. Manufacturing is characterised by monopolistic  
18 competition and increasing returns, uses capital in its fixed cost (one unit of knowledge capital  
19 per variety or firm) and labour in its variable cost. Inter-regional trade in manufacturing goods is  
20 subject to iceberg trade costs. Labour is not mobile between regions and is fixed in quantity.  
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22 Endogenous growth occurs because of a learning curve effect in the construction of knowledge  
23 capital, with firms benefiting from the innovation of others through public knowledge spillovers.  
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25 This reduces the cost of constructing knowledge capital as its stock increases and drives  
26 investment in new knowledge capital and long run economic growth.  
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40 An important feature of the model is that different assumptions can be made about the degree of  
41 trade freeness and the extent to which knowledge spillovers are localised. Together these two  
42 variables have a critical influence on predicted spatial development outcomes. As with other  
43 NEG models, the LS model implies that the reduction of trade costs tends to encourage  
44 agglomeration. On the other hand, increasing the spatial extent of knowledge spillovers tends to  
45 encourage dispersion. The more localised the knowledge spillovers, corresponding for example  
46 to the transfer of tacit knowledge within local clusters, the greater the tendency to agglomeration  
47 and the greater the association between agglomeration and growth. On the other hand, the more  
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globalised the spillovers, corresponding for example to inter-regional research and development collaborations, the greater the tendency for economic activity to disperse and the weaker the association between agglomeration and growth. Thus an association is modelled between geography and growth: where localised knowledge spillovers exist increasing agglomeration will increase innovation and national growth although the greater the global spillovers among regions the weaker this relationship will be. The case where knowledge spillovers are fully global is presented in a ‘global spillovers’ version of the model. Outcomes can also be influenced by two other important variables. One is the degree of congestion in the core region. At high levels of agglomeration an increase in the proportion of firms in the more agglomerated region increases the cost of innovation (despite local knowledge spillovers) and so congestion tends to dampen national growth and encourage dispersal. The second is the direct redistribution of economic activity between regions, as brought about for example by government controls on industrial location or subsidies/incentives that encourage relocation.

***Regional policy effects in the model***

The LS model with congestion provides a global framework for considering the underlying mechanisms through which regional policy may influence the relative competitiveness of regions, the spatial distribution of production and the rate of national growth. The impacts on competitiveness can be seen to come about through the basic logic shown in Figure 1. Regional competitiveness policies may be seen to influence the four key variables highlighted above: redistribution, congestion, trade freeness, and the spatial reach of knowledge spillovers. These in turn are seen to affect the balance between the agglomeration forces (market expansion, local knowledge spillovers) and dispersion forces (market crowding, congestion), the incentives to firms to locate in different regions, the decisions firms make about where to locate and hence

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3 regional competitiveness in terms of the share of industry hosted. The model also suggests that  
4  
5 the consequent shifts in the spatial distribution of production will in turn have impacts on the  
6  
7 national growth rate that are taken up later in this section. Various types of regional  
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9 competitiveness policies that may impact on this system are discussed below.  
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14 INSERT FIGURE 1  
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## 20 21 22 Influences on redistribution 23

24  
25 Regional policy has long been involved in *location marketing and provision of incentives* to  
26  
27 encourage firms to locate in lagging regions. Given that these regions start from relatively low  
28  
29 levels of activity, this is likely to promote market expansion and local spillovers relative to  
30  
31 market crowding and congestion and hence increase the attractiveness of lagging regions to  
32  
33 further factor inflows. Some countries also operate *national spatial planning frameworks* that  
34  
35 seek to steer investments towards certain regions and away from others by influencing costs or  
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37 controlling development in certain places. Often these policies seek to disperse economic activity  
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39 from core regions to less congested regions, thus increasing the competitiveness of lagging  
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41 regions, although policy could also work the other way in an effort to increase agglomeration  
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43 benefits.  
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## 49 50 Influences on congestion 51

52 Policies that involve *pricing externalities* may have a significant influence on congestion levels.  
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54 Thus negative externalities may be taxed in congested regions, for example through road charging  
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and higher taxation of local property, profits and labour, whilst subsidising positive externalities in non-congested areas may also contribute to reducing congestion. Better *local spatial planning policies* that lead to more efficient locations, densities and connections among activities may also reduce congestion. Furthermore, *redistribution policies* and better *intra-regional transport* in core or peripheral regions are likely to reduce the degree of congestion in core regions whilst better *inter-regional transport* will tend to increase congestion.

Influences on trade freeness

Improvements in *inter-regional transport infrastructure* such as major road, rail, port and airport improvements are likely to increase inter-regional trade freeness, which NEG modelling suggests will tend to increase spatial concentration. Improvements in *intra-regional transport infrastructure*, such as urban ring-roads and bypasses, local road and rail communications and various public transport improvements, can also have important effects, encouraging relocation to beneficiary regions whether in the core or periphery.

Influences on the spatial reach of knowledge spillovers

The Figure introduces a distinction between policies that promote spillovers by acting *indirectly* on agents, for example by improving infrastructures and networks for trade in ideas in the regions in which agents operate and policies that promote spillovers by acting on agents *directly*, improving their capacity to generate, transfer and absorb knowledge, for example with support for innovation and entrepreneurship. Both are likely to promote growth, but the spatial consequences depend critically on whether the spillovers that are generated are mainly local (promoting concentration) or global (promoting dispersal). In simple terms, interventions focused on increasing knowledge transfers within a region will tend to strengthen local spillovers

whilst those that work across regional boundaries will tend to strengthen global spillovers. Indirect policies that are important in this respect include *cluster policies*, which are likely to increase localised spillovers, and *knowledge transfer policies*, such as telecommunications improvements, supply chain development, researcher mobility programmes and incentives for science-industry linkages, which facilitate the trade in ideas and may be principally locally or globally focused. The case of *transport improvements* is also interesting. PUGA (2002) makes an important distinction between inter-regional transport infrastructure that supports the trade in goods and services and that which supports the trade in ideas (largely passenger transport). The latter may have important effects on increasing global spillovers, favouring dispersal, whilst the former are more likely to favour concentration.

Direct policies supporting knowledge spillovers include *human capital policies* such as the training of scientists, technologists, technicians and professionals, *innovation policies*, including financial incentives for product and process development and activities to support research and development collaborations, and *entrepreneurship policies* such as support for academic spin-outs and for the start-up and growth of other knowledge-based enterprises, which can also stimulate knowledge diffusion (AUDRETSCH and KEILBACK, 2005; ACS and PLUMMER, 2005). Again these policies can vary in the extent to which they favour local vis-à-vis global spillovers, depending on the precise approach taken.

An important evaluation task from the NEG perspective is therefore to seek to establish the impact of such policies on the agglomeration and dispersal forces, the impact of changes in these forces on the relative attractiveness of regions to mobile factors (in the case of the LS model just capital, but in principle also labour), and how this in turn leads to changes in regional economic activity shares. The model suggests that the influences will be transmitted through changes in

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2  
3 firm costs, productivity and profitability which create shifts in regional economic activity shares  
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5 via changes in the location decisions of inward investors and entrepreneurs responding to changes  
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7 in these incentives. This gives evaluators a useful point of entry to assess what is happening in  
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9 the system using traditional firm survey approaches to complement other techniques. Finally,  
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11 circular causation effects are expected to operate, releasing positive and negative externalities that  
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13 magnify the initial impacts. Thus an increase in the share of industry in a given region will  
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15 further strengthen local spillover and market expansion effects but will also strengthen market  
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17 crowding and congestion effects. At a certain point in relative regional growth or decline it is  
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19 anticipated that the additional dispersion forces will equal the additional agglomeration forces and  
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21 a new spatial equilibrium will be reached.  
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27 ***Spatial equity and growth: predictions from the model***  
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30 The discussion so far has concentrated on policy influences on regional industry shares.  
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32 However, one of the key advantages of using a dynamic model is that it can also reveal potential  
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34 relationships between the geography of production and the rate of national growth. In the LS  
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36 model with congestion this relationship results from the way that changes in industry  
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38 concentration affect the amount of localised knowledge spillovers and the degree to which  
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40 congestion generates growth constraints. It is possible to shed light on these relationships by  
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42 examining the results of ‘policy experiments’ as written up in recent policy-oriented NEG papers  
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44 and notably in BALDWIN *et al.* (2003 ch. 17). Some important results are summarised below.  
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49 *The trade-off.* If localised knowledge spillovers are important then a trade-off may exist between  
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51 national growth and spatial equity because when industry is concentrated a greater proportion of  
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53 firms will benefit from knowledge spillovers and the entire economy will be on a higher growth  
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path. Policies to reduce regional disparities may therefore reduce growth whilst policies designed to increase growth may increase disparities.

*Growth compensation.* The trade-off may nonetheless be mitigated through ‘growth compensation’ since both core and periphery firms and consumers are likely to benefit from more rapid innovation in the core and in many circumstances this may lead to welfare improvements in poor regions even as they lose activity shares. In the model this works through reductions in the manufacturing price index, but in practice it may also work through other processes.

*Increasing growth and equity by spreading knowledge spillovers.* Policies that increase knowledge spillovers among regions act at the same time as a stimulus to growth and to dispersion, since both core and periphery firms benefit from global spillovers. Policies that increase the spatial extent of knowledge spillovers are therefore both pro-growth and pro-equity.

*Increasing growth and equity by reducing congestion.* In the presence of congestion costs, policies that redistribute activity away from core regions may also be both pro-growth and pro-equity. In particular, congested regions may experience a stronger labour market constraint than other regions such that reducing activity in the core may reduce inflationary pressures and enable a more growth-oriented national monetary and fiscal stance. Improved transport and housing provision in the core and policies to reduce the market failures behind congestion are other potential mechanisms to achieve the same effect and there is therefore an evaluation question concerning the relative effectiveness of these approaches.

*Threshold effects.* Finally, the model highlights how policies affecting trade freeness and the spatial extent of knowledge spillovers can have very non-linear effects on economic geography.



For example, an improvement in internal transport connections inside a rich region or of inter-regional transport infrastructures could have no effect on growth or equity until a threshold is reached, past which the economy could rapidly shift to a more concentrated equilibrium and more rapid growth. Similarly, a policy to increase the spatial extent of spillovers may at first have no effect on geography and growth until a threshold is passed at which point the poor region may start innovating.

**4. Challenges for regional policy evaluation**

NEG analysis, then, suggests that regional competitiveness policies may be associated with a number of spatial development processes that are not well articulated by alternative theoretical frameworks and that policy impacts are also often very context-specific and thus difficult to establish a priori. This implies that evaluation evidence on policy impacts in specific contexts should play a strong role in guiding regional policy design and that NEG insights on the potential mechanisms involved should be taken into account in this evaluation process. Here we focus on five main challenges that have not been fully addressed in regional policy evaluations to date.

***Challenge 1: Extending the scope of policy activities evaluated***

In line with regional competitiveness thinking more generally, the NEG places emphasis on the need to evaluate a wide range of interventions that improve regional operating environments or provide direct support to agents in target regions, going well beyond the direct subsidies to mobile firms that were the main focus of regional policy evaluations of the past (e.g. MOORE, RHODES and TYLER, 1986). It also suggests the need to evaluate certain types of activity often

considered to lie outside of the domain of regional policy or usually examined independently from other regional policy interventions, including local and national spatial planning policies, congestion charging and transport infrastructure improvements. In particular, the LS model implies that stronger evaluation attention should be paid to policies that may affect knowledge spillovers and their spatial extent.

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***Challenge 2: Assessing inter-relationships among regions***

The NEG holds that regional policy impacts in one region will also have impacts on others through displacement, factor movements and circular causation effects. The critical influence on this is the *relative* competitiveness of regions. Thus policy support to a specific region might be expected to increase its competitiveness and hence its share of economic activity, but for this to be the case factor returns must be increased relative to other regions, which are also likely to be applying policy support. Thus policy could lead to absolute improvements in a given target region but that region could still suffer factor outflows and decline if factor rewards were to improve to a greater extent in its competitor regions. In other words, economic outcomes depend not just on policy activities and other conditions in target regions but also on those in their competitors. To properly understand regional policy costs and benefits evaluation must therefore make an assessment of policy-induced changes across all the regions of a nation or integrated economic space, but this is not the case in most traditional regional competitiveness policy evaluations, which concentrate on examining impacts within single target regions. A particular issue here is that whilst it is often considered that better inter-regional transport infrastructure will improve the competitiveness of peripheral regions, as reflected in its importance as a major strand of European Regional Development and Cohesion Fund support, the NEG suggests that the opposite may happen, i.e. transport improvements may facilitate firms in serving peripheral markets from the centre. Comparative evidence across regions is important in evaluating these issues.

***Challenge 3: Assessing national efficiency impacts through net agglomeration economies***

Modern regional policy seeks to increase national efficiency and growth as well as redistribution

by increasing productivity and resource utilisation on the supply-side of regional economies in both prosperous and poor regions. Whilst current NEG models have had little to say about resource utilisation, the NEG assessment of the influences on regional productivity places strong emphasis on how agglomeration economies may increase both static efficiency (e.g. by stimulating exploitation of internal economies of scale within the firm) and those seen to drive increasing returns to capital, labour and knowledge and hence sustainable national growth (e.g. by increasing local knowledge spillovers). This suggests the need for evaluation to start to address the issue of policy impacts on agglomeration economies. In developing this agenda it is important to focus on net rather than gross agglomeration economies, i.e. agglomeration benefits minus agglomeration costs, and to look at aggregate impacts across all regions. This reflects the NEG notion that the positive impacts of factor movements in some regions (e.g. increased thickness of labour markets, intermediate goods supply and knowledge spillovers in growing regions) are likely to have negative counterparts in others (through reductions in the same effects in declining regions), although factor movements out of congested regions could have positive impacts on reducing agglomeration diseconomies there whilst at the same time benefiting recipient regions. It is the relative weight of the positive and negative effects on agglomeration economies that is important for understanding the overall impact on national efficiency and growth. Two additional considerations in this respect are that the balance of the marginal costs and benefits of an increase in agglomeration is likely to vary with existing agglomeration size and that agglomeration benefits may be stronger within clusters, suggesting that evaluations should provide guidance to policy makers on how their strategies should seek to influence existing urban hierarchy and sectoral specialisation patterns.

**Challenge 4: Assessing the growth-equity trade-off**

A further evaluation challenge relates to the potential presence of a trade-off between national growth and spatial equity. The central issue is that redistribution to lagging regions, while improving spatial equity, may reduce national growth by impeding the formation of agglomeration economies. However, the NEG suggests that the relationship is complicated. In part this is because there may be ‘growth compensation’ to the periphery working through mechanisms such as the spread of innovation, access to lower priced goods, increased supply opportunities, commuting or migration opportunities and tax redistribution. In addition, there may be ‘win-win’ situations in which policy may be able to increase both equity and growth, for example when policy redistributes activity away from congested areas or increases the spatial extent of knowledge spillovers. Assessment of these issues is particularly important because if evaluation were to demonstrate that regional policy stimulates national growth then this would imply increased government revenues for given tax rates such that the tax and opportunity costs of regional policy might be neutral or negative. The additional revenue would provide a strong justification for regional policy, particularly if growth were achieved in tandem with redistribution.

**Challenge 5: Understanding threshold effects**

A final challenge is to understand the threshold effects that potentially may affect how much policy effort is required to affect regional competitiveness. If the context is not conducive, for example if inter-regional trade costs are too low or knowledge spillovers are too localised, then even strong policy expenditures may have little impact on relative regional competitiveness and hence the geography of production. On the other hand, if policy shifts trade freeness or the spatial extent of knowledge spillovers past a certain threshold, then the theory suggests that a

major spatial redistribution of production may occur with relatively small policy effort. An understanding is therefore needed of the location of thresholds in given situations and the behaviour of the economy around these thresholds. It also needs to be recognised that threshold effects can complicate the interpretation of previous evaluation results because it may be difficult to predict future effects of policy from past effects in other contexts.

## 5. Conclusion

This paper has sought to explore how NEG theoretical insights can be employed in considering the questions that regional policy evaluation should pose and what it should seek to measure. The central message is that, despite its limitations, policy makers and evaluators should be aware of the issues raised by the NEG and consider how its theoretical insights might be incorporated into their evaluation frameworks. There are two major potential benefits. The first is the possibility to build a more robust 'theory of change' than provided by the currently predominant eclectic or a-theoretical approaches to regional competitiveness. The second is the possibility to use the insights of dynamic models such as the LS model as a framework to guide evaluation of the growth impacts of regional policy and the potential trade-offs between growth and equity. Beyond this, examination of the specific spatial development processes implied by the NEG suggests a number of new directions for regional policy evaluation. These include extension of the scope of the activities evaluated, assessment of inter-relationships among regions, assessment of the impact on net agglomeration economies, assessment of the trade-off between national growth and spatial equity and understanding the role of threshold effects. A fundamental issue that spans all these challenges is the need to evaluate the costs and benefits of regional competitiveness policies nationally and not just in individual target regions as is the usual practice today. One of the most important messages of the NEG is that regional competitiveness is a

relative concept and can be affected as much by developments outside of given regions as by the efforts of those regions themselves. Regional policy evaluation practices need to evolve significantly if these issues are to be addressed satisfactorily.

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**Table 1**      **Main agglomeration and dispersion forces in selected NEG models**

Model	Agglomeration forces	Dispersion forces
Core-Periphery	Market expansion from customer entry encourages in-migration by mobile firms  Reduced cost of consumption goods from supplier entry encourages in-migration by mobile workers due to lower trade costs on locally-produced goods	Market crowding from competitor entry encourages out-migration by mobile firms
Footloose Capital	Market expansion from customer entry encourages in-migration by mobile firms	Market crowding from competitor entry encourages out-migration by mobile firms
Footloose Entrepreneur	Market expansion from customer entry encourages in-migration by mobile firms  Reduced cost of consumption goods from supplier entry encourages in-migration by mobile entrepreneurs	Market crowding from competitor entry encourages out-migration by mobile firms
Constructed Capital	Market expansion from customer entry encourages immobile firms to construct capital	Market crowding from competitor entry encourages immobile firms to depreciate capital
Vertical Linkages	Market expansion from customer entry encourages in-migration by mobile firms  Reduced intermediate input costs from supplier entry encourages in-migration by mobile firms	Market crowding from competitor entry encourages out-migration by mobile firms

Local Spillover	<p>Market expansion from customer entry encourages in-migration by mobile firms</p> <p>Greater local knowledge spillovers from innovator entry encourages in-migration by mobile firms</p>	Market crowding from competitor entry encourages out-migration by mobile firms
Local Spillover with Congestion	<p>Market expansion from customer entry encourages in-migration by mobile firms</p> <p>Greater local knowledge spillovers from innovator entry encourages in-migration by mobile firms</p>	<p>Market crowding from competitor entry encourages out-migration by mobile firms</p> <p>Congestion from firm entry encourages out-migration by mobile firms</p>

Source: Drawn from BALDWIN *et al.* (2003)



Figure 1 A simplified NEG/LS model framework for regional policy evaluation

